REMARKS

Claims 32, 34, 36-45, 47-50 and 51-55 are currently pending in the instant application. By way of the present response, Applicant has amended claims 32, 36-42, and 47-49 in order to more particularly point out and distinctly claim the subject matter which Applicant regards as the invention. No new matter has been added. Applicant respectfully requests reconsideration of the present application and the allowance of all claims now presented.

Claim Rejections - 35 U.S.C. § 102

The Examiner has rejected claims 32, 37, 41, 47, 48, 51, and 52 under 35 U.S.C. § 102(b) as being anticipated by EP 095747, and also under 35 U.S.C. § 102(e) as being anticipated by Mertens et al, US Patent No. 6,491,764, hereinafter "Mertens." The Examiner also rejected claims 32, 34, 36-38, 40-44, 47-49, and 53-55 under 35 U.S.C. § 102(e) as being anticipated by Lorimer, US Patent No. 6,460,552, hereinafter "Lorimer."

The Examiner states that Applicant's arguments filed on 7/23/07 were considered but not persuasive. Firstly, the Examiner states that the conventional meaning of "separately" does not exclude the term "simultaneously," that the specification does not define the term differently than the conventional meaning provided by the Examiner, and that Applicant's arguments filed on 7/23/07 were more specific than the claims. In addition, the Examiner states that Applicant's

argument that Lorimer teaches application of a vapor in a gaseous state while the claims require application of a liquid DI water are not persuasive.

Independent claims 32, 37, and 42 relate to a method of cleaning a wafer (for convenience only, similar elements of claims 32, 37, and 42 are described together using terminology of claim 32) comprising: exposing the frontside of the spinning wafer to an etchant or cleaning chemicals, then applying a liquid (claims 32 and 42) or vapor produced from a liquid (claims 37 and 42) having a lower surface tension than water, then **dispensing a liquid DI water through a nozzle** and applying the liquid DI water to a wafer, wherein the liquid (claims 32 and 42) or vapor produced from a liquid (claims 37 and 42) having a lower surface tension than water is applied to the frontside of the wafer **separately from and not simultaneously with or while the liquid DI water is applied to** the frontside of the wafer.

Support for the limitation of dispensing a liquid DI water through a nozzle can be found, for example, in paragraph [0021] of the application which reads in part "DI water is dispensed onto its surface through nozzle 114 for rinsing the wafer."

Support for the limitation of "separately from and not simultaneously with or while the liquid DI water is applied to the frontside of the wafer" can be found in paragraph [0024] of the application where it is stated:

> "In an alternative embodiment of the present invention, one can blow IPA vapor or dispense IPA liquid on the wafer immediately after the chemical dispense step and **before** DI water is dispensed on the wafer for rinsing. In such a case, the IPA vapor is used to remove the bulk of the chemicals. In yet another embodiment, IPA vapor is blown on the wafer on one spot by the nozzle, simultaneously to or while DI water is dispense on another spot with another nozzle."

Thus, paragraph [0024] states that in one embodiment the IPA vapor or liquid can be dispensed **before** DI water is dispensed, while in another embodiment they may be dispensed **simultaneously to** or **while** the other is dispensed. Additionally, the last sentence paragraph [0014] of the application describes an alternative embodiment (not currently claimed) in which the terms "**separately**" and "**simultaneously with**" are used exclusively, where it is stated "The IPA vapor or N2 blowing can be done separately or simultaneously with DI water dispensing to speed up the rinse."

Therefore, the limitation of "wherein the liquid (claim 32) or vapor produced from a liquid (claim 37) having a lower surface tension than water is applied to the frontside of the wafer separately from and not simultaneously with or while the liquid DI water is applied to the frontside of the wafer" is consistent with and supported by the original disclosure.

Claims 32, 37, 41, 47, 48, 51, 52 (EP 0905747 and Mertens)

It is Applicant's understanding EP 0905747 and Mertens are closely related and therefore Applicant discusses them together herein. In summary, it is Applicant's understanding that EP 0905747 and Mertens fail to disclose or suggest (1) applying a liquid having a lower surface tension than water, and (2) applying a liquid having a lower surface tension than water separately from and not simultaneously to or while applying the liquid DI water.

Firstly, it is Applicant's understanding that EP 0905747 and Mertens are limited to applying a "gaseous substance" to the surface of a substrate, mixing the

gaseous substance with a liquid and yielding a mixture having a surface tension lower than the liquid. In [0024] of EP 0905747, the term "gaseous substance" is defined as either comprising: a vaporized substance or gas. As is differentiated by Applicant in claims 32 and 37, liquid and vapor produced from a liquid are distinct from one another. **Accordingly, neither EP 0905747 nor Mertens disclose the element of applying a *liquid* having a lower surface tension than water as is claimed by Applicant in claim 32.**

Secondly, it is Applicant's understanding that neither EP 0905747 nor Mertens disclose or suggest the element of "wherein the liquid (claim 32) or vapor produced from a liquid (claim 37) having a lower surface tension than water is **applied to the frontside of the wafer separately from and not simultaneously with or while the liquid DI water is applied to** the frontside of the wafer."

The Examiner states that EP 0905747 and Mertens disclose the steps of "spinning a wafer and application to the spinning wafer an etchant or cleaning solution and a gaseous substance having a lower surface tension than water and rinsing and drying" in the order claimed by Applicant in claims 32, 37, 41, 47, 48, 51 and 52. Applicant respectfully disagrees and urges that not only do EP 0905747 and Mertens not disclose the successive and separate steps claimed by Applicant but that the references additionally teach away from the claimed steps by specifically disclosing and advocating the step of "supplying a surface tension reducing gaseous substance **together with** the liquid." See EP 0905747 [0011].

The Examiner has pointed to EP 0905747 [0007] – [0017], [0024] – [0031], and more specifically to [0026] and [0028] to provide support for teaching the sequential and separate steps as claimed by Applicant in independent claims 32 and 37. Applicant has again reviewed the entire references and in particular those paragraphs cited by the Examiner. In order to not obscure or unnecessarily conflate the present response Applicant respectfully points the Examiner to pages 12-14 of Applicant's arguments filed on 7/23/07 to show that the references do not teach the sequential and separate steps claimed by Applicant.

Accordingly, Applicant respectfully submits that neither EP 0905747 nor Mertens disclose or suggest the element of "wherein the liquid (claim 32) or vapor produced from a liquid (claim 37) having a lower surface tension than water is **applied to the frontside of the wafer separately from and not simultaneously with or while the liquid DI water is applied to** the frontside of the wafer." Applicant submits that it is clear from the cited paragraphs on pages 12-14 of Applicant's arguments filed on 7/23/07 that EP 0905747 and Mertens are limited to a cleaning and drying process where a local liquid-vapor boundary is created by **simultaneously applying both** a gaseous substance and liquid. The local liquid-vapor boundary is then guided to the edge of the wafer by moving the gaseous substance and liquid sources.

In view of the above remarks, a specific discussion of dependent claims 41, 47, 48, 51, and 52 is considered to be unnecessary. Therefore, Applicant's silence regarding dependent claims 41, 47, 48, 51, and 52 is not to be interpreted as

agreement with, or acquiescence to, the rejection of such claim or as waiving any argument regarding that claim.

Accordingly, Applicant respectfully requests withdrawal of the § 102 rejections of claims 32, 37, 41, 47, 48, 51, and 52 as being anticipated by EP 0905747 and Mertens.

Claims 32, 34, 36-38, 40-44, and 46-50 (Lorimer)

It is Applicant's understanding that Lorimer fails to disclose or suggest (1) applying a liquid (or vapor produced from a liquid) having a lower surface tension than water separately from and not simultaneously to or while applying the liquid DI water, and (2) dispensing a liquid DI water through a nozzle.

Firstly, Lorimer also fails to disclose or suggest applying a liquid (or vapor produced from a liquid) having a lower surface tension than water separately from and not simultaneously to or while applying the liquid DI water. In fact, Lorimer teaches away from the use of a separate liquid DI water rinse and instead Lorimer applies the low surface tension vapor and water vapor **combined** as a single steam rinse. See col. 7. Accordingly, Applicant respectfully submits that Lorimer does not disclose or suggest the element of "wherein the liquid (claim 32 and 42) or vapor produced from a liquid (claim 37 and 42) having a lower surface tension than water is **applied to the frontside of the wafer separately from and not simultaneously with or while the liquid DI water is applied to** the frontside of the wafer."

Furthermore, Lorimer fails to disclose dispensing a liquid DI water through a nozzle. Specifically, Lorimer discloses a workpiece cleaning system including a "vapor phase inlet positioned to apply a vapor phase to a first surface of the workpiece." Col. 4, lines 55-56. Then, "**[t]he steam entering nozzle area 138 impinges on the wafer 30** near the center, and is quickly condensed as it proceeds toward the outer diameter by the relatively cool wafer." Col. 10, lines 33-37. Thus, it is clear that Lorimer dispenses a steam vapor **in a gaseous phase through nozzle area 138**, and that the gaseous steam does not condense and form a liquid until after it is applied. To the contrary, Applicant claims "dispensing a liquid DI water through a nozzle" and not a vapor.

In view of the above remarks, a specific discussion of dependent claims 34, 36, 38, 40-44, 48, 49, and 53-55 is considered to be unnecessary. Therefore, Applicant's silence regarding dependent claims 34, 36, 38, 40-44, 48, 49, and 53-55 is not to be interpreted as agreement with, or acquiescence to, the rejection of such claim or as waiving any argument regarding that claim.

Accordingly, Applicant respectfully requests withdrawal of the § 102 rejections of claims 32, 34, 36-38, 40-44, 47-49, and 53-55 as being anticipated by Lorimer.

Claim Rejections - 35 U.S.C. § 103

The Examiner alternatively rejected claims 39 and 45 under 35 U.S.C. § 103(a) as being unpatentable over Lorimer in view of Chang et al., U.S. Patent No. 6,273,099 ("Chang"). The Examiner alternatively rejected claims 38 and 39 under 35 U.S.C. § 103(a) as being unpatentable over any one of Mertens or EP 0905747 in view of Chang.

Chang is introduced to disclose the use of heated DI water. It is Applicant's understanding that Chang discloses an immersion rinse with heated DI water for batch processing, followed by three or more rinses. Chang fails to disclose or suggest a single wafer process, as well as the steps of applying a chemical, followed by a surface tension lowering fluid, and then a separate DI rinse that is not applied simultaneously with or while the surface tension lowering fluid is a applied. Therefore, Chang fails to remedy the deficiencies of Lorimer, Mertens, and EP 0905747.

In view of the above remarks, a specific discussion of the dependent claims is considered to be unnecessary. Therefore, Applicants' silence regarding any dependent claim is not to be interpreted as agreement with, or acquiescence to, the rejection of such claim or as waiving any argument regarding that claim.

Applicant, accordingly, respectfully requests withdrawal of the rejections of claims 39 and 45 under 35 U.S.C. § 103(a) as being unpatentable over Lorimer in view of Chang, and the rejections of claims 38 and 39 under 35 U.S.C. § 103(a) as being unpatentable over any one of Mertens or EP 0905747 in view of Chang.

Pursuant to 37 C.F.R. 1.136(a)(3), applicant(s) hereby request and authorize the U.S. Patent and Trademark Office to (1) treat any concurrent or future reply that requires a petition for extension of time as incorporating a petition for extension of time for the appropriate length of time and (2) charge all required fees, including extension of time fees and fees under 37 C.F.R. 1.16 and 1.17, to Deposit Account No. 02-2666.

Respectfully submitted,

BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN

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